

IN THE CLAIMS:

1. (Currently amended) A method for cutting a hole of a hole size in a composite material workpiece, the method comprising the steps of:

providing the composite material workpiece;  
selecting a milling cutter having an effective cutter size less than the hole size;  
mounting the composite material workpiece in operable relation to the milling cutter;

rotating the milling cutter about an axis of rotation; and  
advancing the milling cutter longitudinally into the composite material workpiece parallel to the axis of rotation at a rate of longitudinal advance, while laterally moving the milling cutter perpendicular to the axis of rotation to interpolate the hole, and while maintaining the hole substantially flat bottomed as the milling cutter advances.

2. (Original) The method of claim 1, wherein the step of providing includes the step of

providing a ceramic matrix composite material workpiece.

3. (Original) The method of claim 1, wherein the step of providing includes the step of

providing a silicon carbide/silicon carbide composite material workpiece.

4. (Original) The method of claim 1, wherein the step of mounting includes the steps of

providing a backing fixture, and

affixing the composite material workpiece to the backing fixture with an adhesive material.

5. (Currently amended) The method of claim 4, wherein the step of affixing includes the step of  
affixing the composite material workpiece to the backing fixture with a ~~thermosetting~~ thermoplastic adhesive material.

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6. (Original) The method of claim 4, including an additional step, after the step of advancing, of  
removing the composite material workpiece from the backing fixture.

7. (Currently amended) The method of claim 1, wherein the step of advancing includes the step of  
controlling the rate of longitudinal advance such that the hole remains substantially a flat-bottomed ~~hole~~ as it is cut.

8. (Original) The method of claim 1, wherein the hole is cylindrical with a hole diameter, and wherein the step of selecting includes the step of  
selecting the miller cutter to be cylindrical with an effective cutter diameter less than the hole diameter.

9. (Original) The method of claim 1, wherein the step of advancing includes the step of  
advancing the milling cutter longitudinally into the composite material workpiece less than a thickness of the composite material workpiece, thereby forming a blind hole.

10. (Original) The method of claim 1, wherein the step of advancing includes the step of  
advancing the milling cutter longitudinally into the composite material workpiece by at least a thickness of the composite material workpiece, thereby forming

a through hole.

11. (Original) A method for cutting a hole of a hole size in a composite material workpiece, the method comprising the steps of:

providing the composite material workpiece;

selecting a milling cutter having an effective cutter size less than the hole size;

mounting the composite material workpiece in operable relation to the milling cutter wherein the step of mounting includes the steps of

providing a backing fixture, and

affixing the composite material workpiece to the backing fixture with an adhesive material;

rotating the milling cutter about an axis of rotation;

advancing the milling cutter longitudinally into the composite material workpiece parallel to the axis of rotation at a rate of longitudinal advance, while laterally moving the milling cutter perpendicular to the axis of rotation to interpolate the hole, the step of advancing including the step of controlling the rate of longitudinal advance such that the hole has a substantially constant depth over its entire area as it is cut; and, after the hole is completed,

removing the composite material workpiece from the backing fixture.

12. (Currently amended) The method of claim 11, wherein the step of providing includes the step of

providing a ceramic matrix composite material workpiece having a brittle ceramic matrix.

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13. (Original) The method of claim 11, wherein the step of providing includes the step of

providing a silicon carbide/silicon carbide composite material workpiece.

14. (Original) The method of claim 11, wherein the composite material workpiece has a front face to which the milling cutter is first contacted and an oppositely disposed back face, and wherein the step of providing the backing fixture includes the step of

providing the backing fixture having a shape conformed to the back face of the composite material workpiece.

15. (Original) The method of claim 14, wherein the step of providing the backing fixture includes the step of

providing a nonplanar backing fixture.

16. (Currently amended) The method of claim 11, wherein the step of affixing includes the step of

affixing the composite material workpiece to the backing fixture with a thermosetting thermoplastic adhesive material.

17. (Original) The method of claim 11, wherein the hole is cylindrical with a hole diameter, and wherein the step of selecting includes the step of

selecting the miller cutter to be cylindrical with an effective cutter diameter less than the hole diameter.

18. (Original) The method of claim 11, wherein the step of advancing includes the step of

advancing the milling cutter longitudinally into the composite material workpiece less than a thickness of the composite material workpiece, thereby forming a blind hole.

19. (Original) The method of claim 11, wherein the step of advancing includes the step of

advancing the milling cutter longitudinally into the composite material workpiece by at least a thickness of the composite material workpiece, thereby forming a through hole.

20. (New) A method for cutting a hole of a hole size in a composite material workpiece, the method comprising the steps of:

providing a ceramic-matrix composite material workpiece having fibers embedded in a brittle ceramic matrix;

selecting a milling cutter having an effective cutter size less than the hole size;

mounting the composite material workpiece in operable relation to the milling cutter wherein the step of mounting includes the steps of

providing a backing fixture, and

affixing a back face of the composite material workpiece to the backing fixture;

rotating the milling cutter about an axis of rotation; and

advancing the milling cutter longitudinally into the composite material workpiece parallel to the axis of rotation at a rate of longitudinal advance from a front face of the composite material workpiece toward the back face, while laterally moving the milling cutter perpendicular to the axis of rotation to interpolate the hole.

21. (New) The method of claim 21, wherein the step of advancing includes the step of

maintaining the hole substantially flat-bottomed as the milling cutter advances.